

same way; this also is a third time repeated, if it is desired to have the scent very strong. After the last process, the seeds are taken in their swollen state and placed in a mill; the oil is then expressed, and possesses most fully the scent of the flower.* The oil is kept in prepared skins called *dubbers*, and is sold at so much per seer. The *Jasmine* and *Bela*† are the two flowers from which the natives in this district chiefly produce their scented oil, the *Chumbul*‡ is another; but I have been unable to procure any of this. The season for manufacture is coming on. The present oils were manufactured a year ago, and do not possess the powerful scent of that which has been recently prepared. Distillation is never made use of for this purpose as it is with the roses, the extreme heat, (from its being in the middle of the rains, when the trees come into flower) would most likely carry off all the scent. The *Jasmine*, or *Chymbele* as it is called, is used very largely amongst the women, the hair of the head, and the body, being daily smeared with some of it. The specimen I send you costs at the rate of two Rupees per seer.

July 10, 1839.

ART. VII.—*Report on the manufacture of Tea, and on the extent and produce of the Tea Plantations in Assam.* By C. A. BRUCE, Superintendent of Tea Culture.

(Presented by the Tea Committee, August 16th, 1839.)

I submit this report on our Assam Tea with much diffidence, on account of the troubles in which this frontier has been unfortunately involved. I have had something more than Tea to occupy my mind, and have consequently not been able to commit all my thoughts to paper at one time; this I hope will account for the rambling manner in which I have treated the subject. Such as my report is, I trust it will be found acceptable, as throwing some new light on a subject of no little importance to British India, and the British public generally. In drawing out this report, it gives me much pleasure to say, that our information and knowledge respecting Tea and Tea tracts are far more extensive than when I last wrote on this subject;—the number of tracts now known amounting to 120, some of them very extensive, both on the hills and in the plains. A reference to the accompanying map will

* A closely similar plan is followed in Europe in the preparation of the *Jasmine*, and several other very fugitive perfumes. The fixed oil employed is usually that of the *Ben* or *Moringa* nut, with which cotton is soaked. The cotton and flowers are then placed in alternate layers, as in the Indian process.—EDS.

† *Jasminum zambac.*

‡ *Jasminum grandiflorum.*

shew that a sufficiency of seeds and seedlings might be collected from these tracts in the course of a few years to plant off the whole of Assam ; and I feel convinced, from my different journeys over the country, that but a very small portion of the localities are as yet known.

Last year in going over one of the hills behind *Jaipore*, about 300 feet high, I came upon a Tea tract, which must have been two or three miles in length, in fact I did not see the end of it ; the trees were in most parts as thick as they could grow, and the Tea seeds (smaller than what I had seen before) fine and fresh, literally covered the ground ; this was in the middle of November, and the trees had abundance of fruit and flower on them. One of the largest trees I found to be two cubits in circumference, and full forty cubits in height. At the foot of the hill I found another tract, and had time permitted me to explore those parts, there is no doubt but I should have found many of the Naga Hills covered with Tea. I have since been informed of two more tracts near this. In going along the foot of the Hills to the westward, I was informed that there was Tea at *Teweack*, or near it : this information came too late, for I had passed it just a little to the east of the *Dacca* river, at a place called *Cheriedoo*, a small hill projecting out more than the rest on the plain to the northward, with the ruins of a brick temple on it ; here I found Tea, and no doubt if there had been time to examine, I should have found many more tracts. I crossed the *Dacca* river at the old fort of *Ghergong*, and walked towards the Hills, and almost immediately came upon Tea. The place is called *Hauthoweah*. Here I remained a couple of days, going about the country, and came upon no fewer than thirteen tracts. A *Dewaniah* who assisted me to hunt out these tracts, and who was well acquainted with the leaf, as he had been in the habit of drinking tea during his residence with the *Singphoes*, informed me that he had seen a large tract of Tea plants on the Naga mountains, a day's journey west of *Chiridoo*. I have no reason to doubt the veracity of this man ; he offered to point out the place to me, or any of my men, if they would accompany him ; but as the country belonged to *Raja Poorunda Sing*, I could not examine it. I feel convinced the whole of the country is full of Tea.

Again, in going further to the south-west, just before I came to *Gabren* hill, I found the small hills adjoining it, to the eastward, covered with Tea plants. The flowers of the Tea on these hills are of a pleasant delicate fragrance, unlike the smell of our other Tea-plants ; but the leaves and fruit appear the same. This would be a delightful place for the manufacture of Tea, as the country is well populated, has abundance of grain, and labour is cheap. There is a small stream called the

Jhangy river, at a distance of two hours walk ; it is navigable, I am informed, all the year round for small canoes, which could carry down the Tea ; and the place is only one and a half day's journey from *Jorehaut*, the capital of Upper Assam. South-west of *Gabrew Purbut* (about two days journey) there is a village at the foot of the hill, inhabited by a race called *Norahs* ; they are *Shans*, I believe, as they came from the eastward, where Tea abounds. I had long conversations with them, and the oldest man of the village, who was also the head of it, informed me, that when his father was a young man, he had emigrated with many others, and settled at *Tipum*, opposite *Jaipore*, on account of the constant disturbances at *Munkum* ; that they brought the Tea plant with them and planted it on the *Tipum* hill, where it exists to this day ; and that when he was about sixteen years of age, he was obliged to leave *Tipum*, on account of the wars and disturbances at that place, and take shelter at the village where he now resides. This man said he was now eighty years of age, and that his father died a very old man. How true this story is, I cannot say, and do not see what good it would do the old man to fabricate it. This was the only man I met with in my journeys about the country who could give any account of the Tea plant, with the exception of an *Ahum*, who declared to me that it was *Sooka*, or the first *Kacharry Rajah* of Assam, who brought the Tea plant from *Munkum* ; he said it was written in his *Putty*, or history. The *Ahum-Putty* I have never been able to get hold of ; but this I know, that the information about the Tea plant pointed out by the old *Norah* man, as being on the *Tipum* hill, is true ; for I have cleared the tract where it grew thickest, about 300 yards by 300, running from the foot of the hill to the top. The old man told me his father cut the plant down every third year, that he might get the young leaves.

To the west of *Gabrew* I did not find any Tea ; but to the westward of the *Dhunseeree* river I found a species, though not the same as that we use. If the people on the west side of the *Dhunseeree* river were acquainted with the true leaf, I think Tea would be found. I planted it all along the route I went, which may lead to its eventual discovery ; but people should be sent to search for the plant who are really acquainted with it. I think a vast quantity of Tea would be brought to light if this were done. A reference to the map will shew how our tracts are distributed all over the country. How much Tea they would all produce if fully worked, I will not pretend to say ; but in the course of this subject, I will mention such matters relative to the tracts and the plants on them, that every one may make his own calculation. Until lately we had only two Chinese Black-Tea makers. These men have

twelve native assistants ; each Chinaman with six assistants can only superintend one locality, and the Tea leaves from the various other tracts, widely separated, must be brought to these two places for manufacture. The consequence is, that an additional number of labourers must always be employed to bring the leaves from so great a distance. The leaves suffer when brought in large quantities from a distance, as they soon begin to ferment, and the labour of only preparing them so far in process that they may not spoil by the morning, is excessive. The men have often to work until very late to accomplish this. When labour falls so very heavy, and on so very few, it cannot be expected that it can be equally well executed, as if more had been employed. The leaves last gathered are also much larger than they ought to be, for want of being collected and manufactured earlier ; consequently the Tea is inferior in quality. I mention this, to shew the inconvenience and expense of having so few Tea makers.

The samples of Black-Tea made by the twelve assistants having been approved of by the Tea Committee in Calcutta, it was my intention to have distributed the men amongst the different tracts, but the late disturbances on our frontier have prevented this arrangement ; and I have been obliged to employ ten men in Assam (two others having gone to Calcutta in charge of Tea) at the tract called *Kahung*, which is becoming a very extensive and important Tea locality—so many others being near it, which can all be thrown into one. When we have a sufficient number of manufacturers, so that we can afford to have some at each tract, or garden, as they have in China, then we may hope to compete with that nation in cheapness of produce ; nay, we might, and ought, to undersell them ; for if each tract, or garden, had its own Tea maker and labourers, the collecting of the leaves would not perhaps occupy more than twelve days in each crop ; after which the men might be discharged, or profitably employed on the Tea grounds. But now, for the want of a sufficient number of labourers and Tea makers, there is a constant gathering of leaves throughout the month ; and as I said before, those gathered last can only make inferior Teas ; besides the great loss by the leaves getting too old, and hereby unfit for being made into any Tea ; and all this entirely for want of hands to pluck the leaves. It is true we have gained twelve Black-Tea makers this year, in addition to the last ; and twelve more native assistants have been appointed, who may be available next year to manufacture Tea independently, as they were learning the art all last year. We have also had an addition to our establishment of two Chinese Green-Tea manufacturers, and twelve native assistants have been placed under them as learners ; but what are these compared

to the vast quantity of Tea, or the ground the Tea plants cover, or might be made to cover in three years, but a drop of water in the ocean? We must go on at a much faster pace in the two great essentials—Tea manufacturers, and labourers,—in order to have them available at each garden, when the leaves come into season.

• If I were asked, when will this Tea experiment be in a sufficient state of forwardness, so as to be transferable to speculators? I would answer, when a sufficient number of native Tea manufacturers have been taught to prepare both the Black and the Green sort; and that under one hundred available Tea manufacturers, it would not be worth while for private speculators to take up the scheme on a large scale; on a small one it would be a different thing. In the course of two or three years we ought to have that number. Labourers must be introduced, in the first instance, to give a tone to the Assam Opium-eaters; but the great fear is, that these latter would corrupt the new comers. If the cultivation of Tea were encouraged, and the Poppy put a stop to in Assam, the Assamese would make a splendid set of Tea manufacturers and Tea cultivators.

In giving a statement of the number of Tea tracts, when I say that *Tingri*, or any other tract is so long and so broad, it must be understood, that space to that extent only has been cleared, being found to contain all the plants which grew thickly together; as it was not thought worth while at the commencement of these experiments to go to the expense of clearing any more of the forest for the sake of a few straggling plants. If these straggling plants were followed up, they would in all probability be found gradually becoming more numerous, until you found yourself in another tract as thick and as numerous as the one you left; and if the straggling plants of this new tract were traced, they would by degrees disappear until not one was to be seen. But if you only proceeded on through the jungles, it is ten to one that you would come upon a solitary Tea plant, a little further on you would meet with another; until you gradually found yourself in another new tract, as full of plants as the one you had left, growing absolutely so thick as to impede each others growth. Thus I am convinced one might go on for miles from one tract into another. All my Tea tracts about *Tingri* and *Kahung* are formed in this manner, with only a patch of jungle between them, which is not greater than what could be conveniently filled up by thinning those parts that have too many plants. At *Kahung* I have lately knocked three tracts into one, and I shall most probably have to continue doing the same until one tract shall be made of what now consists of a dozen. I have never seen the end of *Juggindoo's* Tea tract,

nor yet *Kujudoo's* or *Ningrew's*. I feel confident that the two former run over the hills and join, or nearly join, some of our tracts in the *Muttuck* country. Nor have I seen the end of *Kahung* tract, all about that part of the country being one vast succession of Tea from *Rungagurra* on the *Debrew*, to *Jaipore* on the *Buri Dehing*. It may be seen on inspecting the map how thickly the Tea localities are scattered—those that are known; and they are but a small portion compared to those that are unknown. There is the *Namsong* tract on the *Naga* hills, the largest that has yet been seen, and the extent of which is not ascertained. The tracts on the *Gubind* hills are unknown; and this is likewise the case with *Haut Holah* and *Cheridoo*; so that there is a large field for improvement throughout, to say nothing of the *Singho* tracts, which may be found to be one unbounded link to *Hookum*; and who knows but it crosses the Irrawaddy to China? Many Tea tracts I know have been cut down in ignorance by the natives, to make room for the rice field, for firewood, and fences, but many of these tracts have sprung up again, more vigorous than before. Witness that at *Ningrew*, where the natives say that every thing was cut down, and the land planted with rice, except on the high ground.

With respect to the Tea plant being most productive on high or low ground, I cannot well say, as all our tracts are on the plains; but from what little I have seen of the hill tracts, I should suppose they were not more productive. In China the hill tracts produce the *best* Teas, and they may do the same here. Almost all my tracts on the plains are nearly on the same level, I should think. *Nudwa* perhaps is a little higher than *Tingri*, and *Tingri* a little higher than *Kahung*, but I believe they are equally productive; although if I leaned towards any side, with my limited experience, I should say that the low land, such as at *Kahung*, which is not so low as ever to be inundated by the strongest rise in the river, is the best. The plants seem to love and court moisture, not from stagnant pools, but running streams. The *Kahung* tracts have the water in and around them; they are all in heavy tree-jungles, which makes it very expensive to clear them. An extent of 300 by 300 will cost from 200 to 300 rupees; i. e. according to the manner in which the miserable Opium-smoking Assamese work. This alone ought to point out the utility of introducing a superior race of labourers, who would not only work themselves, but encourage their women and children to do the same;—in plucking and sorting leaves they might be profitably turned to account for both parties. This I have not been able to instil into the heads of the Assamese, who will not permit their women to come into the Tea gardens. Indeed unless more labourers can be furnished, a larger amount

of Tea must not be looked for at present. Last season it was with the greatest difficulty that I could get a sufficient number of hands to gather the leaves. The plucking of the leaves may appear to many a very easy and light employment, but there are not a few of our coolies who would much rather be employed on any other job; the standing in one position so many hours occasions swellings in the legs, as our plants are not like those of China, only three feet high, but double that size, so that one must stand upright to gather the leaves. The Chinese pluck theirs squatting down. We lie under a great disadvantage in not having regular men to pluck the leaves; those that have been taught to do so, can pluck twice as many as those that have not, and we can seldom get hold of the same men two seasons running. I am of opinion that our trees will become of a smaller and more convenient size after a few years cultivation; because, trimming of the plants, and taking all the young leaves almost as soon as they appear, month after month and year after year, and the plants being deprived of the rich soil they had been living on from time unknown, must soon tell upon them. Transplanting also helps to stunt and shorten the growth of these plants. The Chinese declared to me, that the China plants now at *Deenjoy* would never have attained to half the perfection they now have, under ten years in their own country.

I may here observe, that the sun has a material effect on the leaves; for as soon as the trees that shade the plants are removed, the leaf, from a fine deep green, begins to turn into a yellowish colour, which it retains for some months, and then again gradually changes to a healthy green, but now becomes thicker, and the plant throws out far more numerous leaves than when in the shade. The more the leaves are plucked, the greater number of them are produced; if the leaves of the first crop were not gathered, you might look in vain for the leaves of the second crop. The Tea made from the leaves in the shade is not near so good as that from leaves exposed to the sun; the leaves of plants in the sun are much earlier in season than of those in the shade; the leaves from the shady tract give out a more watery liquid when rolled, and those from the sunny a more glutinous substance. When the leaves of either are rolled on a sunny day, they emit less of this liquid than on a rainy day. This juice decreases as the season advances. The plants in the sun have flowers and fruit much earlier than those in the shade, and are far more numerous; they have flowers and seeds in July, and fruit in November. Numerous plants are to be seen that by some accident, either cold or rain, have lost all their flowers, and commence throwing out fresh

flower-buds more abundantly than ever. Thus it is not unfrequent to see some plants in flower so late as March (some of the China plants were in flower in April) bearing at once the old and the new seeds, flower-buds, and full-blown flowers—all at one and the same time. The rain also greatly affects the leaves; for some sorts of Tea cannot be made on a rainy day; for instance the *Pouchong* and *Mingehew*. The leaves for these ought to be collected about 10 A. M. on a sunny morning, when the dew has evaporated. The *Pouchong* can only be manufactured from the leaves of the first crop; but the *Mingehew*, although it requires the same care in making as the other, can yet be made from any crop, provided it is made on a sunny morning. The Chinese dislike gathering leaves on a rainy day for any description of Tea, and never will do so, unless necessity requires it. Some pretend to distinguish the Teas made on a rainy and on a sunny day, much in the same manner as they can distinguish the shady from the sunny Teas—by their inferiority. If the large leaves for the Black-Tea were collected on a rainy day, about seven seers, or fourteen pounds, of green leaves would be required to make one seer, or two pounds, of Tea; but if collected on a sunny day, about four seers, or eight pounds, of green leaves, would make one seer, or two pounds, of Tea;—so the Chinamen say. I tried the experiment, and found it to be correct. Our season for Tea making generally commences about the middle of March; the second crop in the middle of May; the third crop about the first of July; but the time varies according to the rains setting in sooner or later. As the manufacture of the *Sychee* and the *Mingehew* Black-Teas has never been described, I will here attempt to give some idea how it is performed.

Sychee Black-Tea. The leaves of this are the *Souchong* and *Pouchong*. After they have been gathered and dried in the sun in the usual way (see my former account of Black-Tea) they are beaten and put away four different times; they are then put into baskets, pressed down, and a cloth put over them. When the leaves become of a brownish colour by the heat, they throw out and have a peculiar smell, and are then ready for the pan, the bottom of which is made red hot. This pan is fixed in masonry breast high, and in a sloping position, forming an angle of forty degrees. Thus the pan being placed on an inclined plane, the leaves, when tossed about in it cannot escape behind, or on the sides, as it is built high up, but fall out near the edge close to the manufacturer, and always into his hands, so as to be swept out easily. When the bottom of this pan has been made red hot by a wood fire, the operator puts a cloth to his mouth to prevent inhaling any of the hot vapour. A man on the left of him stands ready with a basket

of prepared leaves; one or two men stand on his right with dollahs, or shallow baskets, to receive the leaves from the pan, and another keeps lifting the hot leaves thrown out of the pan into the dollah, that they may quickly cool. At a given signal from the Chinaman, the person with the basket of prepared leaves seizes a handful and dashes it as quick as thought, into the red hot pan. The Chinaman tosses and turns the crackling leaves in the pan for half a minute, then draws them all out by seizing a few leaves in each hand, using them by way of a brush, not one being left behind. They are all caught by the man with the dollah or basket, who with his disengaged hand continues lifting the leaves, and letting them fall again, that they may quickly cool. Should a leaf be left behind in the pan by any accident, the cloth that is held ready in the mouth is applied to brush it out; but all this is done as quick as lightning. The man that holds the basket of leaves watches the process sharply; for no sooner is the last leaf out of the pan, than he dashes in another handful, so that to an observer at a little distance, it appears as if one man was dashing the leaves in, and the other as fast dashing them out again—so quickly and dexterously is this managed. As soon as one basket has received about four handfuls of the hot leaves from the pan, it is removed, and another basket placed to receive the leaves; and so on, until all is finished. A roaring wood fire is kept up under the pan to keep the bottom red hot, as the succession of fresh leaves tends greatly to cool the pan, which ought always to be scrubbed and washed out after the process is over. In China these pans are made of cast iron, and if great care is not taken they will crack in the cooling; to prevent which, one man keeps tapping the inside of the edge of the pan briskly with a wet broom, used in the cleaning of the vessel, while another pours cold water in gently; thus it cools in a few seconds, and is ready for another batch of Tea. The leaves are rolled and tatched the same as the other Teas, and put into the drying basket for about ten minutes. When a little dry, people are employed to work and press the leaves in the hands in small quantities, of about one and a half to two rupees weight at a time, for about half a minute; they are then put into small square pieces of paper and rolled up; after this they are put into the drying basket, and permitted to dry slowly over a gentle fire for some hours, until the whole is thoroughly dry. This Tea is not sold in the China market, it is used principally as offerings to the priests, or kept for high days and holidays. It is said to be a very fine Tea, and there is not one man in a hundred who can make it properly. The *Pouchong* Tea is made in the same way as the *Sychee*, with this exception, that it is not formed into balls.

Mingehew Black-Tea. The leaves (*Pouchong*) are plucked and dried in the sun, and are then beaten and dried in the shade for half an hour; this is done three successive times, and the leaves are very much shaken by a circular motion given to them in a sieve, so as to keep them rolling and tumbling about in the centre of it. This treatment continues until they are very soft; they are then allowed to remain for a short time; the contents of the first sieve are then placed in the centre of a close worked bamboo basket with a narrow edge, and the leaves are divided into four equal parts. The contents of the second sieve are placed in another bamboo basket like the former, and this basket is placed on the top of the first, and so on, piling one basket upon another until all is finished;—there may be about two pounds of leaves in each basket. The red hot pan is used the same as in *Sychee*, only now the men cast in one division of the leaves into the basket, and this is tumbled and tossed about in the red hot pan, like a plaything, for about thirty seconds, and then swept out; another division is cast in, and so on, until all the prepared baskets have been emptied. The contents of each basket are still kept separate, by placing the leaves when they come out of the pan in separate baskets. The whole is a brisk and a lively scene, and quite methodical, every one knowing his station, and the part he has to perform. The baskets are then arranged on shelves to air; the contents are afterwards tatched the same as our Black-Teas, and fired in the drying baskets, but with this difference, that each division is placed on paper and dried. When it is half dry (the same as our Teas) it is put away for the night, and the next morning it is picked, and put into the drying baskets over gentle deadened fires, and gradually dried there; it is then packed hot. This Tea is a difficult sort to make.

Shung Paho Black-Tea. Pluck the young (*Paho*) leaf that has not yet blown or expanded, and has the down on it; and the next one that has blown with a part of the stalk; put it into the sun for half an hour, then into the shade; tatch over a gentle fire, and in tatching roll the leaves occasionally in the pan, and spread them all round the sides of the same; again roll them until they begin to have a withered and soft appearance; then spread them on large sieves, and put them in the shade to air for the night; next morning pick, and then fire them well. Some Tea makers do not keep them all night, but manufacture and pack the Tea the same day. This Tea is valued in China, as it is very scarce; but the Chinamen acknowledge that it is not a good sort. They prefer the Teas, the leaves of which have come to maturity.

The China Black-Tea plants which were brought into *Mutuck* in 1837, amounted in all to 1609—healthy and sickly. A few of the lat-

ter died, but the remainder are healthy, and flourish as well, as if they had been reared in China. The leaves of these plants were plucked in the beginning of March, and weighed sixteen seers, or thirty-two pounds. Many of the plants were then in flower, and had small seeds. They are about three feet high, and were loaded with fruit last year, but the greater part of it decayed when it had come to maturity, as was the case with the Assam Tea-seeds, and almost every seed of these wilds, in the past year. The seeds should, I think, be plucked from the plant when thought ripe, and not be permitted to drop or fall to the ground. I collected about twenty-four pounds of the China seeds, and sowed some on the little hill of *Tipum* in my Tea garden, and some in the Nursery-ground at *Jaipore*; above three thousand of which have come up, are looking beautiful, and doing very well. I have since found out that all the China seedlings on *Tipum* hill have been destroyed by some insect.

The Assam and China seedlings are near each other; the latter have a much darker appearance. I have made but few nurseries, or raised plants from seed, as abundance of young plants can be procured, of any age or size, from our Tea tracts. There may be about 6,000 young seedlings at *Chubwa*; at *Deenjoy* about 2,000; at *Tingri* a few; and some at *Paundooah*. In June and July, 1837, 17,000 young plants were brought from *Muttuck*, and planted at a place called *Toongroong Patar*, amongst the thick tree jungles of *Sadiya*.

In March of the same year six or eight thousand were brought from *Muttuck*, and planted in different thick jungles at *Sadiya*; many of these died in consequence of the buffaloes constantly breaking in amongst them; the rest are doing well, but I am afraid will be killed from the above cause; and now that I have removed to *Jaipore*, they are too far off for my personal superintendence.

In 1838, 52,000 young Tea plants were brought from the *Nem-song Naga* hill tracts, about ten miles from *Jaipore*; a great portion of these have been lately sent to Calcutta, to be forwarded to Madras; should they thrive there, it is my opinion that they will never attain any height, at least not like ours, but be dwarfish like the China plants. *Deenjoy*, *Chubwa*, *Tingri*, and *Geela-Jhan* tracts have been filled up or enlarged with plants from the jungle tracts. In transplanting from one sunny tract to another, when done in the rains, very few, if any, die; if the plants be removed from a deep shade to a sunny tract, the risk is greater, but still, if there is plenty of rain, few only will die. If from a deep shade to a piece of ground not a Tea tract, and exposed to the sun—for instance from the *Naga* hills to *Jaipore*—if there be plenty of rain, and the soil congenial, as it is at this place,

few will die ; if shaded by a few trees, less will perish ; if taken from shade, and planted in shade and the soil uncongenial, but there is plenty of rain, the greater portion will live ;—witness *Toongroong Patar* at *Sadiya*. If the plants are brought from deep shade, and planted in the sun in uncongenial soil, let them have ever so much rain, not one in fifty will be alive the third year ;—witness 30,000 brought to *Sadiya*. I believe the Tea plant to be so hardy that it would almost live in any soil, provided it were planted in deep shade when taken to it. There should be plenty of water near the roots, but the plant should always be above inundation. As soon as it has taken root, which it will soon do, the shade may be removed, and there will be no fear of the plant dying.

The advantage of getting plants from the jungle tracts is, that you can get them of any age or size ; nothing more is necessary than to send a few coolies early in March, just as the rains commence, and have the plants of the size required removed to your own garden ; and if they are of a moderate size, you may gather a small crop of Tea from them the next year. As these plants are very slender, it would be best to plant four or five close together to form a fine bush. If the plants are raised from seed, you may expect a small crop of Tea the third year, but they do not come to maturity under six years. It is said they live to the age of forty or fifty years. The Chinese way of digging a hole, and putting in a handful or two of seed, does not succeed so well in this country, as putting two or three seeds on small ridges of earth and covering them over, which I have found to answer better.

In clearing a new Tea tract, if the jungle trees are very large and numerous, it would be as well to make a clean sweep of the whole, by cutting them and the Tea plants all down together ; for it would be impossible to get rid of so much wood without the help of fire. The Tea plants, if allowed to remain, would be of little use after they had been crushed and broken by the fall of the large trees, and dried up by the fire ; but admitting that they could escape all this, the leaves of trees from twelve to twenty feet high could not be reached, and if they could, they would be almost useless for Tea manufacture, as it is the young leaves, from young trees, that produce the best Teas. But if all were cut down and set fire to, we should have a fine clear tract at once, at the least expense, and might expect to have a pretty good crop of Tea one year after the cutting, or, at furthest, the second year ; for it is astonishing with what vigour the plant shoots up after the fire has been applied. And we gain by this process ; for, from every old stock or stump cut down, ten to twelve more vigorous shoots

spring up, so that in the place of a single plant you have now a fine Tea bush. I think from what I have seen of these plants, that if cut down every third year, they would yield far superior Teas; neither am I singular in this opinion; the Green-Tea Chinamen having told me that they cut down their plants every ninth year, which may be reckoned equivalent to our third year, taking into consideration the size of our trees and the richness of our soil. Our trees, or plants, are certainly more than four or five times the size of theirs, and must consequently yield so many times more produce; theirs is the dwarf, ours the giant Tea. The size of the leaf matters nothing, in my opinion, provided it is young and tender; even their diminutive leaf, if one day too old, is good for nothing.

As the Green-Tea Chinamen have just commenced operations, I will try to give some account of this most interesting process. All leaves up to the size of the *Souchong* are taken for the Green-Tea. About three pounds of the fresh leaves, immediately they are brought in, are cast into a hot pan (sometimes they are kept over night when abundance have been brought in, and we have not been able to work all up); they are then rolled and tossed about in the pan until they become too hot for the hand. Two slips of bamboo, each about a foot long, split at one end so as to form six prongs, are now used to tumble and toss the leaves about, by running the sticks down the sides of the pan, and turning the leaves up first with the right hand, then with the left, and this as fast as possible; which keeps the leaves rolling about in the pan without being burnt: this lasts about three minutes; the leaves will then admit of being rolled and pressed without breaking. They are now taken from the pan and rolled in dollahs, much the same as the Black-Tea, for about three minutes, in which process a great quantity of the juice is extracted, if they be fresh leaves; but if they have been kept over night, very little juice can be expressed from them in the morning, on account of its having evaporated. The Chinamen say, this does not matter, as it makes no difference in the Tea. The leaves are then pressed hard between both hands, and turned round and pressed again and again, until they have taken the shape of a small pyramid. They are now placed in bamboo-baskets or dollahs with a narrow edge, and the dollahs on bamboo framework (see fig. 2 of my former account of Black-Tea) where they are exposed to the sun for two or three minutes, after which these pyramids of Tea are gently opened and thinly spread on the dollahs to dry. When the Tea has become a little dry, (which will be the case in from five to ten minutes if the sun be hot) it is again rolled, and then placed in the sun as before; this is done three successive times. But should the

weather be rainy, and there is no hope of its clearing, all this drying is done over the fire in a small drying basket, the same as with Black-Tea. The Green-Tea makers have as great an aversion to drying their Tea over the fire, as the Black-Tea makers. The third time it has been rolled and dried, there is very little moisture left in the Tea ; it is now put into a hot pan, and gently turned over and over, and opened out occasionally, until all has become well heated ; it is then tossed out into a basket, and while hot put into a very strong bag, previously prepared for it, about four feet long, and four spans in circumference. Into this bag the Tea is pressed with great force with the hands and feet ; from fourteen to twenty pounds being put in at one time, and forced into as small a compass as possible. With his left hand the man firmly closes the mouth of the bag immediately above the leaves, while with the right hand he pommels and beats the bag, every now and then giving it a turn ; thus he beats and turns and works at it, tightening it by every turn with one hand, and holding on with the other, until he has squeezed the leaves into as small a compass as possible at the end of the bag. He now makes it fast by turns of the cloth where he held on, so that it may not open ; and then draws the cloth of the bag over the ball of leaves, thus doubling the bag, the mouth of which is twisted and made fast. The man then stands up, holding on by a post or some such thing, and works this ball of leaves under his feet, at the same time alternately pressing with all his weight, first with one foot and then the other, turning the ball over and over, and occasionally opening the bag to tighten it more firmly. When he has made it almost as hard as a stone, he secures the mouth well and puts the bag away for that day. Next morning it is opened out and the leaves gently separated and placed on dollahs, then fired and dried until they are crisp, the same as the Black-Tea, after which they are packed in boxes or baskets. In China the baskets are made of double bamboo, with leaves between. The Tea may then remain on the spot for two or three months, or be sent to any other place to receive the final process. This first part of the Green-Tea process is so simple, that the natives of this country readily pick it up in a month or two.

The second process now commences by opening the boxes or baskets, and exposing the Tea on large shallow bamboo baskets or dollahs (see former account, fig. 1) until it has become soft enough to roll ; it is then put into cast iron pans, set in brick fire-places, the same as described in making the *Sychee* Black-Tea. The pan is made very hot by a wood-fire, and seven pounds of the leaves are thrown into it and rubbed against the pan, with the right hand until tired, and then with the left, so as not to make the process fatiguing. The pan being placed on

an inclined plane the leaves always come tumbling back towards and near the operator, as he pushes them up from him, moving his hand backwards and forwards and pressing on the leaves with some force with the palms, keeping the ends of the fingers up, to prevent their coming in contact with the hot pan. After one hour's good rubbing the leaves are taken out and thrown into a large coarse bamboo-sieve, from this into a finer one, and again a still finer one, until three sorts of Tea have been separated. The first, or largest sort, is put into the funnel of the winnowing machine, which has three divisions of small traps below, to let the Tea out. A man turns the wheel with his right hand, and with the left regulates the quantity of Tea that shall fall through the wooden funnel above, by a wooden slide at the bottom of it. The Tea being thrown from the sieves into the funnel, the man turns the crank of the wheel, and moves the slide of the funnel gradually, so as to let the Tea fall through gently, and in small quantities. The blast from the fan blows the smaller particles of Tea to the end of the machine, where it is intercepted by a circular moveable board placed there. The dust and smaller particles are blown against this board, and fall out at an opening at the bottom into a basket placed there to receive it. The next highest Tea is blown nearly to the end of the machine, and falls down through a trough on the side into a basket; this Tea is called *Young Hyson*. The next being a little heavier, is not blown quite so far; it falls through the same trough, which has a division in the middle; this of course is nearer the centre of the machine. A basket is placed beneath to receive the Tea, which is called *Hyson*. The next, which is still heavier, falls very near to the end of the fan, this is called *Gunpowder* Tea; it is in small balls. The heaviest Tea falls still closer to the fan, and is called *Big Gunpowder*; it is twice or three times the size of *Gunpowder* Tea, and composed of several young leaves that adhere firmly together. This sort is afterwards put into a box and cut with a sharp iron instrument, then sifted and put among the *Gunpowder*, which it now resembles. The different sorts of Tea are now put into shallow bamboo baskets, and men, women, and children are employed to pick out the sticks and bad leaves; this is a most tedious process, as the greatest care is taken not to leave the slightest particle of any thing but good Tea. But to assist and quicken this tiresome process beautiful bamboo sieves, very little inferior to our wire ones, and of various sizes, are employed. The different Teas are thrown into sieves of different sizes, from large *Gunpowder* to *Dust Tea*; they are shaken and tossed, and thrown from one person to another in

quick succession, making the scene very animating; in this way a great portion of the stalks are got rid of. After the Tea has been well sifted and picked, it is again put into the hot pans and rubbed and rolled as before, for about one hour; it is then put into shallow bamboo baskets, and once more examined, to separate the different Teas that may still remain intermixed, and again put into the hot pan. Now a mixture of sulphate of lime and indigo, very finely pulverized and sifted through fine muslin, in the proportion of three of the former to one of the latter, is added; to a pan of Tea containing about seven pounds, about half a tea-spoonful of this mixture is put and rubbed and rolled along with the Tea in the pan for about one hour, as before described. The Tea is then taken hot from the pan and packed firmly in boxes, both hands and feet being used to press it down. The above mixture is not put to the Tea to improve its flavour, but merely to give it a uniform color and appearance, as without it some of the Tea would be light and some dark. The indigo gives it the colour, and the sulphate of lime fixes it. The Chinese call the former *Youngtin*, the latter *Acco*. Large Gunpowder Tea they call *Tychen*; little Gunpowder *Cheocheu*; Hyson, *Chingcha*; Young Hyson, *Uchin*; Skin-Tea, or old leaves in small bits, *Poocha*; the fine Dust, or Powder-Tea, *Chamoot*.

The leaves of the Green-Tea are not plucked the same as the Black, although the tree or plant is one and the same, which has been proved beyond a shadow of doubt; for I am now plucking leaves for both Green and Black from the same tract and from the same plants; the difference lies in the manufacture, and nothing else. The Green-Tea gatherers are accommodated with a small basket, each having a strap passed round the neck so as to let the basket hang on the breast. With one hand the man holds the branch, and with the other plucks the leaf, one at a time, taking as high as the *Souchong* leaf; a little bit of the lower end of the leaf is left for the young leaf to shoot up close to it; not a bit of stalk must be gathered. This is a very slow and tedious way of gathering. The Black-Tea maker plucks the leaves with great rapidity with both hands, using only the forefinger and thumb, and collects them in the hollow of the hand; when his hand is full he throws the leaves into a basket under the shade of the tree; and so quickly does he ply his hands that the eye of a learner cannot follow them, nor see the proper kind of leaf to be plucked; all that he sees, is the Chinaman's hands going right and left, his hands fast filling, and the leaves disappearing. Our coolies, like the Green-Tea Chinamen, hold the branch with one hand, and deliberately pluck off the

leaf required, then the next, and so on, by which process much time is lost, and a greater number of hands are wanted. Not having a regular set of pluckers is a very great drawback to us; for the men whom we teach this year we see nothing of the next; thus every year we have to instruct fresh men. This difficulty will be removed when we get regular people attached to the Tea plantations; or when the natives of these parts become more fixed and settled in their habitations, and do not move off by whole villages from one place to another, as they have of late years been doing; and when the aversion they have throughout Assam to taking service for payment, has been overcome. They seem to hold this as mean and servile; preferring to cultivate a small patch of ground which barely yields a subsistence. I can perceive, however, that there is a gradual change taking place in the minds of the labouring class of people, or coolies; for occasionally some good able-bodied men come forward for employment. The generality of those that have hitherto offered themselves, has been from the very poorest and the most worthless in the country. In the cold season, when the men have nothing to sow or reap, two or three hundred can be collected; but as soon as the rains set in, all but those that have not bonds, or are not involved in debt, go off to their cultivations, at the very time when our Tea operations commence. As long as things continue in this state, the price of Tea will be high; but if this drawback were removed, there is nothing to prevent our underselling the Chinese, except the experience of a few more years.

But let us return to our Teas, and take a comparative view of the qualities of the Black and Green-Teas, which may nearly be as follows: *Paho* Black-Tea leaf would make Green-Tea, some Gunpowder, and some Young Hyson. *Pouchong*, although classed as a second Black-Tea, on account of the price it fetches in the market, is a third-rate leaf, for it is rather larger than the *Souchong*. Some of it would make Young Hyson, and some Skin-Tea. *Souchong* would make Hyson and Young Hyson. *Toychong* would make Skin-Tea.—I will here mention the different kinds of Black-Teas, to make the matter more clear to those who take an interest in the subject. *Thowung-Paho* (the *Sung fa* is the same leaf as this) is the downy little leaf not expanded, and the one next to it that has just unfolded a little. This Tea when made appears full of small white leaves, which are the little downy leaves just mentioned. *Twazee-Paho* is from the second crop, and nearly the same kind of Tea, only a little older; the leaf next the small downy one (being a little more expanded) and the small leaf below this, are taken, making three in all; this has also numerous white leaves, but not so many as the former.

Souchong is the next largest leaf; this is well grown, but embraces all the leaves above it. When the upper leaves have grown out of season for *Thowung-Paho* and *Twazee-Paho*, they are all plucked for the *Souchong* from the third and fourth of the upper leaves. From *Souchong* leaves, the *Minchong* and *Sychee* Teas are made in the first crop, and no other. *Pouchong* is the next largest leaf; it is a little older and larger than the *Souchong*. From this leaf the *Sychee* and *Minchong* Teas can be made in the first crop only. The *Pouchong* is never made in the second crop, on account of its not having a good flavour: many of the *Souchong* leaves are mixed up in this Tea. The *Toychong* leaves are those that are rejected from the *Souchong* and *Pouchong*, as being too large and not taking the roll. When the Teas are picked, these leaves are put on one side. The Chinese often put them into a bag, and give them a twist, something in the Green-Tea way, and then mix them up with the *Souchong* to add to the weight. This leaf (*Toychong*) becomes worse in the second and third crops;—it is a cheap Tea and sold to the poor. All the Black-Teas that are damaged have the flower of what the Chinese call *Qui fa*, and another called *Son fa*, mixed up with them. One pound of the flowers is put to each box of damaged Tea. After the Teas have been well tatched and mixed up with other sorts, these leaves give them a pleasant fragrance. The *Son fa* plant is about two feet high, and kept in flower pots; it is propagated from the roots. The *Qui fa* plant is from three to four feet high; one pound of the flowers is put to a box of Tea. This plant was seen in the Botanical Gardens at Calcutta by our Chinese interpreter. The flowers of this plant are considered finer than those of the *Son fa*. I annex a rough drawing of each of them, as given to me by the interpreter; the dots in the drawings are intended for small flowers.*

The Black-Tea makers appear to me to be very arbitrary in their mode of manufacture; sometimes they will take the leaves of the *Thowung-Paho*, or perhaps *Twazee-Paho*; but if it has been raining, or there is any want of coolies to pluck the leaves quickly, or from any other cause, they will let the leaves grow

* These two sketches are not deemed sufficiently instructive to be added here. One of them is entitled *Qui fa*, which is the name of the *Olea fragrans*, or Sweet-scented Olive, the flowers of which are said to be used for perfuming Teas. But it is more like the *Aglaia odorata*, a very different plant, which is also supposed to be applied in China for a similar purpose. This last, however, is called *Tsjiulang* by the Chinese, according to Rumpf, and *Sam yeip lan* according to Roxburgh. The other sketch, entitled *Lan fa*, seems to be intended for a liliaceous, or at any rate an endogenous plant. I am unable to offer any conjecture about it.—N. W.

a few days longer, and turn all into *Souchong*; which it must be remembered, takes all the small leaves above it. If it is the first crop, the *Souchong* and *Pouchong* leaves may all be turned into *Souchong* Tea; but even if it is the second crop, when the *Pouchong* leaves ought not to be gathered, they are nevertheless plucked and mixed up with the *Souchong* leaves. Almost all our Black- and all the Green-Teas have just been made from one garden. When the Green-Tea makers complained that the leaves were beginning to get too large for them—that is, they were fast growing out of *Souchong* and running into *Pouchong*—the Black-Tea makers took up the manufacture, plucked all the leaves, and made excellent *Pouchong*; so that between the two, there is not a leaf lost. When the Black-Tea makers have a garden to themselves they are cruel pluckers, for they almost strip the tree of leaves for the *Souchong*, and are not at all nice in the plucking; the third and even the fourth leaf on a tender twig is nipped off in the twinkling of an eye; they then look about for more young leaves, and away go the *Pouchong*, and *Toychong* too, which is the largest leaf of all. But the Green-Tea men pluck quietly, one by one, down to *Souchong*. The Black-Tea men separate all their Teas into first, second, third, and fourth crop; but the Green-Tea manufacturers make no distinction; they prepare all the Tea they can, throughout the season, box or basket it up, and when the season is over, they set off for Canton with their produce; at least all those who do not wish to sell their Tea on the spot. The different merchants go in quest of it there. It now indiscriminately undergoes the second process; that is, the different crops are all mixed up together. No old leaves can be mixed in the Green, as in the Black-Teas; for the long rolling in the pan crushes them, and the fan blows them away, so that only the young leaves are left.

We shall now take a comparative view of the number of men required by the Black and the Green-Tea makers for one pair of pans.

For the Black-Tea makers there will be required,

to tatch,	..	..	..	..	..	2 men
— roll,	..	..	..	..	..	4 „
— attend to the fire,	..	.	..	..	..	1 „
— dry,	..	..	..	.	..	1 „
— beat and put in the sun,	..	..	..	..	..	2 „
						<hr/>
Total number of men	..	..	..	..	..	10

To keep these men fully at work, from twenty-five to thirty coolies will be required to pluck leaves, and they will turn out about two

boxes of Tea per day, (weighing one maund, or 80 pounds) if the weather be fine and sunny; but scarcely half that quantity if be rainy, on account of the coolies not plucking so much on a rainy, as they would on a fair sunny day. As the people of the country become acquainted with the gathering and manufacturing, three boxes, of forty pounds each, may be expected in fine weather, adding perhaps a few men to the number of coolies.

A pair of pans for the Green-Tea makers would require during the first process,

to tatch,	...	..	..	..	..	2 men
— receive the Tea from the pans,	..	..	..	..	..	1 „
— roll,	..	..	..	..	..	8 „
— attend to the fire,	..	..	..	..	..	1 „
— put the leaves in the sun and turn them,	..	..	..	..	..	4 „

Total number of men, 16

Thirty coolies would be required to keep these men in full play, and they would turn out two boxes of twenty-three seers, or forty-six pounds each, per day; in all ninety-two pounds of Tea. If the weather be rainy, of course the produce is much less; as the gatherers then do only half work. Thus the difference between the Black and Green is, that the former requires six manufacturers less; and that when the Black-Tea is finished, boxed, and ready for exportation, the Green has only undergone the first process, and is but half finished; although it is ready for exportation to any appointed place to receive the final and troublesome, as well as most expensive part of the process. Nevertheless the first part of the Green-Tea preparation is easily learnt by the natives of this place in about two or three months. In speaking of the trouble and expense attending the second process of the Green-Tea making, I beg to observe that it appears to me, from what little I have seen of it, that machinery might easily be brought to bear; and as Assam is about to become a great Tea country, it behoves us to look to this. The Tea half made, as above described, I am informed by the Green-Tea Chinamen now with me, is put either into boxes or baskets, with bamboo leaves between; it has to make in this state a long journey by land and water, and then to go one or more months in a boat by sea, before it reaches Canton, where it is laid aside for one or two months more, before it undergoes the second process; making in all about five months from the time it was first prepared. All that is required is to keep it dry. Now if all this be true, which I have no doubt it is, I see no reason why we could not send it to England, and have it made up there. I rather see every thing in favor of such a plan,

and nothing against it. After a year's instruction under Chinamen, it might be left to the ingenuity of Englishmen to roll, sift, and clean the Tea by machinery, and, in fact, reduce the price of the Green-Tea nearly one-half, and thus enable the poor to drink good unadulterated Green-Tea, by throwing the indigo and sulphate of lime overboard. At all events the experiment is worthy of a fair trial, and the first step towards it would be to manufacture the Tea at Calcutta; or perhaps it would be better to let the China Green-Tea makers go direct to England along with it, and have it manufactured there at once.

Now for a word about the Lead-canister maker, who is a very important man in our establishment; for without him, we could not pack our Teas.—On two tiles about an inch thick and sixteen inches square, is pasted, on one side, a sheet of very fine thick paper, said to have been made in Cochin-China, over this another sheet is pasted only at the edges. The paper must be very smooth, and without any kind of hole, knob, or blemish. To make it answer the purpose better, fine chalk is rubbed over it. The tiles thus prepared are laid one over the other and moved backwards and forwards, to ascertain if they work smoothly. The lower tile rests on two pieces of wood, about four inches in thickness, and the exact length of the tile. The room where the sheets of lead are made must be very smooth and level, as the tiles are apt to break when there is any unequal pressure on them. In the corner of the room there is a sunken brick fire-place, the upper part of which rises just a little above the floor; into this fire-place is inserted one of the cast iron pans used for making Tea, and in one corner of the masonry is a vent hole on which in general a Tea-kettle stands. The pan is heated by a wood fire; an iron ladle with a handle, about six or eight inches long, answers the purpose of taking the lead out of the pan when required. The pan may hold about twenty pounds. There is also another ladle with a long handle, and holes at the bottom, to take the dross off. When lead for the sides of the boxes is required, the proportion of one maund of lead to five seers of tin is put into the pan. When well melted and freed from dross, the two tiles above mentioned are placed on the two pieces of wood, one piece being nearly under the centre, and the other at the edge of the lower tile; the upper tile is placed on the lower tile even and square, projecting perhaps a little backward towards the operator. The tiles being thus placed near the melted lead, the Chinaman squats down on them, placing his heels near the edge, with his toes towards the centre; while with his left hand he lays hold of the corner tile, and with the right holds the short ladle, which he dips into the boiler, and takes out

about half a ladleful of the molten metal, tipping up the upper tile with the left hand about three inches, at the same time assisting this operation by pressing on his heels and gently lifting his toes. The upper tile being thus raised he dashes in the contents of the ladle between both, lets go with the left hand, and presses on with his toes, which brings the upper tile with some force to its former position over the lower one, and occasions the superfluous lead to gush out right and left and in front. The upper tile is then raised like the lid of a box, while the lower one rests on the piece of projecting wood underneath, and a fine thin sheet of lead, nearly the size of the tiles, is taken out, and thrown on one side; the upper tile is then gently lowered down, another ladle of hot lead dashed in, and so on in quick succession, about four sheets of lead being made in one minute. The lower tile projecting a little beyond the upper one assists the man to lay the ladle on, and pour in the metal firmly and quickly. To vary the operation, the man sometimes stands up and places one foot on the upper tile, working with his heel and toes, the same as if both feet were on, and just as quickly. Many interruptions take place, such as examining the papers on the tiles, rubbing them with chalk, turning them round, and reversing them. Sometimes half a split bamboo is placed in front and under the tiles, with a piece of paper on it, to receive the lead that falls down, so that it may not come in contact with the ground. This lead is every now and then taken up and put back into the boiler. A maund of lead may make about twelve or thirteen boxes, which will hold forty pounds. There are also two other tiles, about a cubit square; these are used for making the tops of the canisters, which are generally of tin only, but can also be made from the above mixture. It is necessary in making this sheet-lead, to hold the sheets up and examine them; for if not properly prepared, there are sometimes a number of very fine holes in them, which are not perceptible when lying on the ground or table. On this account the first twenty sheets of lead are thrown aside and rejected, even without any examination. When the tiles have become nice and warm, it is then the fine and even sheets, without holes, are obtained. Before a sheet-lead canister can be made, it is necessary to have a model box made to fit into the wooden box, that is to hold the sheet-lead canister; on this box or shell the sheet-lead canister is made. It has a hole at the bottom to prevent any suction in putting it in, or drawing it out of the box or canister; and instead of a top it has a bar of wood across, by which it is drawn out. For soldering, tin, with the eighth or twelfth part of quicksilver, and some rosin are used. The wood part of some of the boxes is covered with paper pasted on and dried in the sun. To give the paper on the boxes a yellow colour, a mixture of paste with

pulverized and sifted saffron is laid on and dried. The paper on the corners of the boxes is ornamented by means of a wooden block with flowers carved on it; on this bit of wood very thin paper, cut to its size, is placed, and a mixture, consisting of pulverized saffron, indigo, and water, having a deep green color, is laid singly on each bit of paper with a brush made of cocoanut fibres. These slips of paper are put one above the other, twenty thick, or as long as the paper takes the impression of the carved wood below. When the corners of the boxes have been ornamented with this paper and dried, another mixture, about the proportion of four seers of oil to three seers of rosin, boiled together, is applied with a cocoanut brush over all the boxes as a finish; after these are dry they are ready for the Tea.

The following table will shew the size and produce of the Tea tracts now worked, and the probable amount of Tea for this and the next season.

Names of Tea tracts fully worked in 1838.	Length and breadth of Tea tracts.	Number of plants in each Tea tract.	Average produce of single Tea plants.	Produce in 1838.	Remarks.
No. 1 Tringri,	267 by 90	5,000	4 Sa. Weight,	260 Seers	The plants are small in this tract including China plants.
No. 2 Tringri,	155 by 70	2,340	3-12 Sa. Wt.,	160 "	
No. 1 Kahung,	480 by 210	1,36,000	4 Sa. Weight,	680 "	
No 1 Chubwa,	200 by 160	8,200	4 Sa. Weight,	410 "	
Deenjoy,.....	223 by 171	8,400	2 Sa. Weight,	210 "	
From Shady Tracts, ..	..	..	..	1,720
				390	
				2,110	
The probable increase of the above Tracts for 1839.				527	
Probable produce of 1839.				2,637 Seers		5,274 lbs.

Names of the tracts to be worked in 1840.	Length and breadth of Tea tracts.	Number of plants in each Tea tract.	Probable produce of one Tea plant.	Probable produce in 1840.	Remarks.
No. 2 Kahung,	192 by 114	4,720	3 Sa. Weight,	177	The plants in these tracts now small will not yield a good crop for two years.
No. 3 Do.	215 by 70	3,440	3 Sa. Weight,	129	
No. 2 Chubwa,	160 by 70	2,420	3 Sa. Weight,	90	
Nowholea,	476 by 160	16,480	3 Sa. Weight,	618	
Tipun,	344 by 331	24,620	3 Sa. Weight,	922	
Jugundoo,	400 by 200	17,300	3 Sa. Weight,	648	
Ningrew,	300 by 189	12,260	3 Sa. Weight,	459	
The probable produce of the above 7 tracts,				2,943	
Add the probable produce of the other 5 tracts.				2,637	
Probable produce of all the tracts in 1840.				5,580	11,160 lbs.

It should be borne in mind that this is a rough calculation, and I can only give the probable amount. Most of these plants are very young, or have been recently cut down; a few years hence the plants may yield twice the above quantity. The first table exhibits the absolute produce of 1838. Now let us suppose a new settler were to take land in these parts; what would be his expenses if he were only to cultivate Tea, and had to clear forest land (in the vicinity of the Tea) ten times the size of *Nowholeah*, which is, say 400 by 200 yards, and which would cost him 200 Rupees to clear. Ten such tracts would cover 8,00,000 square yards. Now, to cover this surface of ground with Tea plants, and the plants six feet apart each way, 3,55,555 plants would be required; but if two plants were to be placed together, as I would recommend, then 7,11,110 plants would be required. The cost would probably be at the rate of five annas for 300 plants; thus:

The clearing of 10 tracts, each 400 by 200 yards, ..	2,000	0	0
7,11,110 Tea plants, at 5 annas for 300,	740	11	8
Planting the above,	474	0	0
Weeding each tract 3 times each year, at 30 Rs. each tract,	900	0	0
5 Tea houses, at 50 Rs. each,	250	0	0
200 Hoes at 1 Rupee each,	200	0	0
100 Axes at 1 Rupee each,	100	0	0
100 Daws at 1 Rupee each,	100	0	0
Dollahs, Challonis, &c., bamboo apparatus,	200	0	0
8 Saws at 5 Rs. each,	40	0	0
Charcoal and firewood for baking the Tea,	200	0	0
40 Cast-iron pans, at 4 Rs. each,	160	0	0
Paper for Tea boxes,	100	0	0
Chalk and Indigo,	50	0	0
3 Maunds of Nails of sizes, at 10 Rs. per maund, ..	30	0	0
2 Elephants at 150 Rs. each	300	0	0
2 Elephant mahoots at 6 Rs. each per month,	144	0	0
2 Elephant mates at 4 Rs. each per month,	96	0	0
Rice for 2 Elephants,	96	0	0
Lead for 888 boxes, at 3 seers per box containing 20 seers, at 8 Rs. per maund,	532	12	9
A Cooly sirdar at 10 Rs. per month,	120	0	0
10 Duffadars, or Overseers of coolies at 3 Rs. per month	360	0	0
Coolies to collect leaves, 30 to each tract, 20 days to each crop; for 3 crops, or 60 days, at 3 Rs. for each man per month,	1,800	0	0
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Carried over, ..	8,993	8	5

	Brought over,..	8,993	8	5
4 Native carpenters, at 12 Rs. ditto,		576	0	0
8 Sawyers, at 4 Rs. ditto,		384	0	0
2 Native Lead-canister makers, at 12 Rs. ditto, ..		288	0	0
Coolies to bring in timber for Sawyers,		150	0	0
5 Chinamen at 30 Rs. each per month,		1,800	0	0
120 Native Tea makers at 5 Rs. each, for 5 months, or one season,		3,000	0	0
Freight to Calcutta,		400	0	0
Ditto to England,		1,000	0	0
	Total outlay for 10 tracts, Co's. Rs.	16,591	8	5

Deduct charges that are not annual, viz.—

Clearing of tracts,	2,000	0	0	
Purchase of Tea plants,	740	0	0	
Planting ditto,	474	0	0	
Building Tea houses,	150	0	0	
Purchase of Hoes,	200	0	0	
Do. Axes,.. .. .	100	0	0	
Do. Daws,	100	0	0	
Do. Saws,	40	0	0	
Do. Bamboo apparatus,	200	0	0	
Do. Elephants,	300	0	0	4,304 0 0

Total annual outlay on 10 tracts, 12,287 8 5

Average produce of 3,55,555 tea plants at 4 Sa. } Wt. each plant, is 444 Mds. or 17,777 Srs., } or 35,554 lbs. at 2s., or 1 rupee, per pound, } would be, }	..	35,554	0	0
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Annual profit on 10 tracts, Co's. Rs. 23,266 7 7

<i>Annual outlay</i>	Co's. Rs.	<i>Annual profits</i>	Co's. Rs.
For 10 tracts,	12,287	On 10 tracts,	23,266
For 100 tracts,	1,22,870	On 100 tracts,	2,32,660
For 1000 tracts,	12,28,700	On 1000 tracts,.. .. .	23,26,600

N. B.—The deduction of 4304 Rs. not being annual outlay is not included in this calculation above 10 Tracts.

	Tea tract.	Duffadars.	Takelah.	Coolies.
Required for	1	1	10	30
„ for	10	10	100	300
„ for	100	100	1000	3000

It must be remembered that this calculation has been made on 3,55,555 plants, not on double that number as I proposed, viz. to plant them in pairs, which would certainly, on the lowest calculation, increase the profits thirty per cent. It should be borne in mind also, that 4 sicca weight is not the full produce of each plant; when full grown it will yield double that, or 8 sicca weight, and some even as high as 10 to 12 sicca weight. I have calculated at the rate of 4 sicca, which was absolutely produced in 1838. The plant will, I should think, produce 25 per cent more this year, and go on increasing to what I have above mentioned. But then, on the other hand, the items which I have set down, are not all that will be required to carry on this trade on an extensive scale. The superintendence, numerous additional artizans that will be required, and a thousand little wants which cannot be set down now, but which must necessarily arise from the nature of the cultivation and manufacture, will go far to diminish the profits, and swell the outlay; but this of course will last but a few years, until the natives of the country have been taught to compete with Chinamen. It should also be remembered, that the calculation I have made on ten tracts is on a supposition that we have a sufficient number of native Tea-makers and Canister-makers, which will not be the case for two or three years to come. It is on this point alone that we are deficient, for the Tea plants and lands are before us. Yes, there is another very great drawback to the cultivation of Tea in this country, and which I believe I before noticed, namely the want of population and labourers. They will have to be imported and settled on the soil, which will be a heavy tax on the first outlay; but this, too, will rectify itself in a few years; for, after the importation of some thousands, others will come of themselves, and the redundant population of Bengal, will pour into Assam, as soon as the people know that they will get a certain rate of pay, as well as lands, for the support of their families. If this should be the case, the Assamese language will in a few years be extinct.

I might here observe, that the British Government would confer a lasting blessing on the Assamese and the new settlers, if immediate and active measures were taken to put down the cultivation of Opium in Assam, and afterwards to stop its importation, by levying high duties on Opium land. If something of this kind is not done, and done quickly too, the thousands that are about to emigrate from the plains into Assam, will soon be infected with the Opium-mania,—that dreadful *plague*, which has depopulated this beautiful country, turned it into a land of wild beasts, with which it is overrun, and has degenerated the Assamese, from a fine race of people, to the most abject,

servile, crafty, and demoralized race in India. This vile drug has kept, and does now keep, down the population; the women have fewer children compared with those of other countries, and the children seldom live to become old men, but in general die at manhood; very few old men being seen in this unfortunate country, in comparison with others. Few but those who have resided long in this unhappy land know the dreadful and immoral effects, which the use of Opium produces on the native. He will steal, sell his property, his children, the mother of his children, and finally even commit murder for it. Would it not be the highest of blessings, if our humane and enlightened Government would stop these evils by a single dash of the pen, and save Assam, and all those who are about to emigrate into it as Tea cultivators, from the dreadful results attendant on the habitual use of Opium? We should in the end be richly rewarded, by having a fine, healthy race of men growing up for our plantations, to fell our forests, to clear the land from jungle and wild beasts, and to plant and cultivate the luxury of the world. This can never be effected by the enfeebled Opium-eaters of Assam, who are more effeminate than women. I have dwelt thus long on the subject, thinking it one of great importance, as it will affect our future prospects in regard to Tea; also from a wish to benefit this people, and save those who are coming here, from catching the plague, by our using timely measures of prevention.

Monthly outlay of the present standing Establishment.

	<i>Co's. Rs.</i>		
Superintendent,	500	0	0
1st Assistant to Do.	100	0	0
2nd Do. Do.	70	0	0
1 Chinese Black-Tea maker,	55	11	6
1 Ditto Assistant to Ditto	11	1	6
1 Ditto Tea-box maker,	45	0	0
1 Ditto Interpreter,	45	0	0
1 Ditto Tea-box maker,	15	8	6
2 Ditto Green-Tea makers, at 15 : 8 : 6 each,	31	1	0
1 Ditto Tea-box maker,	33	4	6
1 Ditto Lead-canister maker,	22	3	0
24 Native Black-Tea makers, at 5 each, ,.. .. .	120	0	0
12 Native Green-Tea makers, at 5 each,	60	0	0
1 Native Carpenter,	4	0	0
1 Coolie Sirdar,	10	0	0

Carried over, ... 1,122 14 0

	Brought over, ..	1,122	14	0
4 Mahouts, at 6 each,		24	0	0
4 Ditto Mates, at 4 each,		16	0	0
Rice for 4 Elephants per month,		18	0	0
4 Sawyers, at 4 each,		16	0	0
2 Dâk runners, at 3 : 8 : 0 each,		7	0	0
4 Duffadars, at 3 each,		12	0	0
Fixed monthly expenditure in Assam,		1,215	14	0
Cash paid to Chinese families in China,		131	2	6
	Total monthly expenditure, 1,347	0	6	

or 16,000 a year, not including coolies and other items. It should be remembered that this establishment has been confined to a few tracts as an experiment, and has never been fully worked. The Chinese Green-Tea makers, Canister-makers and Interpreter, have lately been added to the establishment; their services have not as yet been brought into account. We are just now availing ourselves of them by making Green-Tea; and as the natives at present placed under them become available, large quantities of excellent Green-Tea will be manufactured. I suppose two Chinamen might qualify twenty-four natives for the first process; the second, as I have already recommended, might be performed in England, which in my humble opinion would effect a great saving, by getting machinery to do the greater part of the work. At all events, it never could be manufactured in Assam without a great expense, and this for want of labourers. However, it is gratifying to see how fast the Chinese acquire the Assamese language; for, after they have been a year in the country, they begin to speak sufficiently well for all ordinary purposes, so that an interpreter can very well be dispensed with. Our Chinamen can speak the Assamese language much better than the interpreter can the English language. They are a violent, headstrong, and passionate people, more especially as they are aware we are so much in their power. If the many behave as do the few, a Thannah would be necessary to keep them cool.

With respect to what are called the *Singpho* Tea tracts, I am sorry to say we have not been able this year to get a leaf from them, on account of the disturbances that have lately occurred there; nor do I believe we shall get any next year, unless we establish a post at *Ningrew*, which I think is the only effectual way to keep the country quiet, and secure our Tea. The Tea from these tracts is said by the Chinamen to be very fine. Some of the tracts are very extensive, and

many may run for miles into the jungles for what we know; the whole of the country is capable of being turned into a vast Tea garden, the soil being excellent, and well adapted for the growth of Tea. On both sides of the Buri-Dehing river, as will be seen by the map, the Tea grows indigenous; it may be traced from tract to tract to *Hookum*, thus forming a chain of Tea tracts from the Irrawaddy to the borders of China, east of Assam. Ever since my residence at Sudiya this has been confirmed year after year by many of my Kamtee, Singpho, and Dewaneah acquaintances, who have traversed this route. It is therefore important for us to look well to our Eastern frontier, on account of our capability to extend our Tea cultivation in that direction. England alone consumes 31,829,620 lbs. nearly four laks of maunds, annually. To supply so vast a quantity of Tea, it will be necessary to cultivate all the hills and vallies of Assam; and on this very account a post at *Ningrew* becomes doubly necessary. A few years hence, it may be found expedient to advance this frontier post to the top of the *Patkai* hill, the boundary line of our eastern frontier. Any rupture with Burmah would add to our Tea trade, by taking from them *Hookum* and *Munkoom*, and having the Irrawaddy as our boundary line. These countries are nominally under the Burmese, as they pay a small annual tribute; but this can never be collected without sending an armed force. They are said to be thinly inhabited, the population being kept down by the constant broils and wars, which one petty place makes upon another for the sake of plunder. All the inhabitants drink Tea, but it is not manufactured in our way; few, it is said, cultivate the plant. I have for years been trying to get some seeds or plants from them, but have never succeeded, on account of the disturbed state in which they live. The leaves of their Tea plants have always been represented to me as being much smaller than ours.

Muttuck is a country that abounds in Tea, and it might be made one extensive, beautiful Tea garden. We have many cultivated experimental tracts in it; we know of numerous extensive uncultivated tracts, and it appears to me that we are only in the infancy of our discoveries as yet. Our Tea, however, is insecure here. It was but a month or two ago that so great an alarm was created, that my people had to retire from our Tea gardens and manufacture at Deenjoy and Chubwa, which will account for the deficiency of this year's crop. Things must continue in this state until the government of the country is finally settled; for we are at present obliged, in order to follow a peaceful occupation, to have the means of defending ourselves from a sudden attack, ever since the unfortunate affair at Sudiya. Before the transfer of the Tea tracts in this country can be made, it will be

necessary, in justice to all parties, to know if *Muttuck* is, or is to become, ours or not. The natives at present are permitted to cultivate as much land as they please, on paying a poll-tax of two rupees per year; so that if the country is not ours, every man employed on the Tea will be subject to be called on for two rupees per annum, to be paid to the old Bura Senaputy's son, as governor of the country. This point is of vital importance to our Tea prospects up here. Many individuals might be induced to take Tea grounds, were they sure, that the soil was ours, and that they would be protected and permitted to cultivate it in security.

In looking forward to the unbounded benefit the discovery of this plant will produce to England, to India,—to Millions, I cannot but thank God for so great a blessing to our country. When I first discovered it, some 14 years ago, I little thought that I should have been spared long enough to see it become likely eventually to rival that of China, and that I should have to take a prominent part in bringing it to so successful an issue. Should what I have written on this new and interesting subject be of any benefit to the country, and the community at large, and help a little to impel the Tea forward to enrich our own dominions, and pull down the haughty pride of China, I shall feel myself richly repaid for all the perils and dangers and fatigues, that I have undergone in the cause of British India Tea.

JAIPORE,

10th June, 1839.

ART. VIII.—*Proceedings of the Asiatic Society.*

(*Wednesday Evening, the 7th August, 1839.*)

The Honorable Sir E. RYAN, President, in the chair.

Read the Proceedings of the last Meeting.

Read the following letter from Professor WILSON :—

Library, East India House, London, 12th April, 1839.

DEAR SIR,—The continued serious illness of Mr. J. PRINSEP, and the uncertainty of its termination, render it impossible to communicate with him on the affairs of the Asiatic Society, and I must therefore trouble you on a subject on which he wrote to me on the Society's behalf sometime ago. Under the authority I then received, I applied to Sir F. CHANTREY to furnish the Society with a copy of his bust of Mr. COLEBROOKE, and of one of Sir W. JONES, from the head of the statue in St. Paul's Cathedral. Both have been prepared under his superintendence by a sculptor of great merit, his pupil Mr. WEEKES, and are nearly completed. The cost is severally sixty